



E1209

JACC March 27, 2012

Volume 59, Issue 13

**Imaging**

## NON-INVASIVE EVALUATION OF CORONARY ARTERY COLLATERAL FLOW USING COMPUTED TOMOGRAPHIC ANGIOGRAPHY

ACC Moderated Poster Contributions

McCormick Place South, Hall A

Saturday, March 24, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Imaging: CT - Novel Applications of Coronary CTA

Abstract Category: 24. Imaging: CT

Presentation Number: 1113-582

Authors: *Jin-Ho Choi, Young Bin Song, Joo-Yong Hahn, Seung Hyuk Choi, Jae Oh, YeonHyeon Choie, Hyeon-Cheol Gwon, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, South Korea*

**Background:** Quantitative evaluation of collateral flow by coronary CT angiography (CCTA) has not been examined. We assessed the value of transluminal attenuation gradients (TAG) by CCTA to determine extent and/or direction of coronary collateral flow.

**Methods:** From 105 patients (male gender 79%, age  $61.6 \pm 11.0$  years) undergoing invasive coronary angiography (ICA) and CCTA, the Rentrop score and direction of collateral flow in 121 totally occluded vessels was compared to the TAG by CCTA of the vessel segment distal to total occlusion (TAGdistal). TAG was defined as the linear gradient of luminal attenuation along coronary artery.

**Results:** TAGdistal increased consistently and significantly with the degree of collateral flow, from  $-4.43 \pm 4.02$  HU/mm for Rentrop score 0 to  $0.82 \pm 1.08$  HU/mm for Rentrop score 3 ( $p < 0.0001$ ). TAGdistal was also significantly higher in retrograde flow compared to antegrade collateral flow ( $-2.45 \pm 3.04$  HU/mm versus  $1.33 \pm 2.59$  HU/mm,  $p < 0.0001$ ). Well-developed collaterals, defined as vessels with a Rentrop score of 2 or 3, were observed in 42.1% (51/121) of vessels, and were reliably predicted by the TAGdistal. For a cutoff value of  $\geq -1.28$  HU/mm, diagnostic sensitivity, specificity, positive predictive value and negative predictive values were 86.3%, 47.1%, and 54.3%, 82.5%, respectively, with an area under the receiver operating characteristic curve of 0.689 (95% CI = 0.598 - 0.770,  $p < 0.0001$ ).

**Conclusions:** Quantitative assessment of TAG by CCTA in vessel segments distal to a total occlusion enables determination of the degree and direction of coronary collateral circulation, as well as the presence of angiographically well-developed collateral vessels.